OHIO DIGITAL EMERGENCY NET
OHDEN
STANDARD OPERATING GUIDE
(SOG)
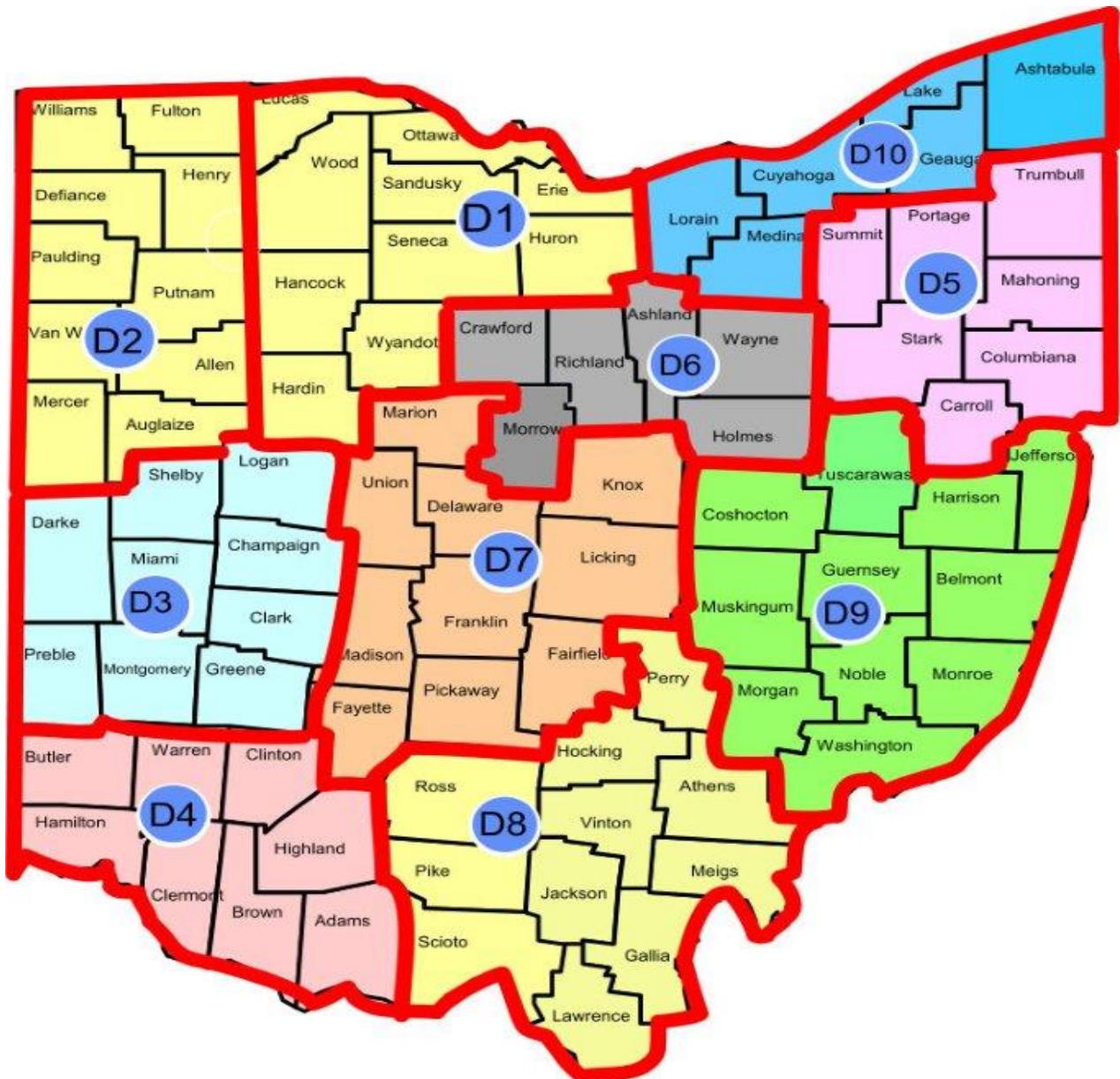
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Foreword

The Ohio Digital Emergency Network is part of the Ohio ARES program of amateur radio (ham) operators who provide a backbone structure to transfer digital messages from county to county and on to the Ohio Emergency Management Agency " or other served agencies when all else fails". We encourage every county to have a representative on our weekly net for readiness checks and training. Please post questions or contact the group admin if you are interested in advanced digital communications on the popular HF ham bands.

The purpose of this Guide is provide uniform guidance to the Section regarding the special purpose high frequency network. Our intention is to make this a living document and periodically update it to reflect new processes and technology as the situation merits.

Our appreciation goes out to W1HKJ who is considered the father of the Narrow Band Emergency Messaging System software and philosophy which OHDEN is organized around. His paper on the attached link serves as a great introduction to how NBEMS has been successful in other ARES and RACES Sections.

<p align="center">http://www.w1hkj.com/NBEMS/PublicService.pdf</p>

Please make all SOG change requests and queries to W5UHQ@arrl.net or post them in our Website https://www.Facebook.com/groups/OHDEN   This FACEBOOK group provides a convenient forum for discussing administrative and technical issues which we practice hands on during the training nets.

Standard Setup Recommendations

Interface Hardware:

There are really no unique hardware requirements for OHDEN. NBEMs hardware setups are found in several internet sources. The popularity of this system is frequently attributed to the low cost and freedom of unique hardware common to other HF systems. This help file from

http://www.w1hkj.com/FldigiHelp-3.22/configuration_page.html

should answer most questions on how to setup your digital mode station with a single side band HF transceiver and most laptops, desktops, and even some smart devices.

First thing you will need (assuming you have a ssb radio and a computer) is an Interface MODEM or Terminal Net Controller (TNC). These sound card modes are unique in that they leverage software virtual MODEMs as opposed to hardware filters and demodulators of other modes such as PACTOR and other high speed packet modes. Good new is that some of the later radios from ICOM have all the necessary sound and control interfaces built into the radio. All you will need is a cable or a network connection.

Here is what I have used for the past ten years as a digital soundcard interface and it works fine. Rig Blaster Plug and Play   The advantage to this interface is that it allows direct control of CIV buss transceiver frequency, mode, etc, with one USB connection which FLRIG and other popular rig control programs can talk to. It does require however the use of the sound card (or a separate USB sound dongle) in your computer for audio input and output. I use the sound dongle approach because it provides flexibility for the various FLDIGI and DX modes I regularly use without messing with the default sound card and still taking advantage of the transformers in the Rig Blaster.

Another very popular interface which is very good especially on VHF and UHF transceivers is the Signal Link which comes with a flexible transceiver interface and a built in USB SOUNDCARD. This allows FLDIGI to send and receive transformer isolated (highly recommended) audio between the computer and radio and includes a vox type push to talk to put your radio into transmit mode. The primary deficiency is that it does not include the USB commanded HF rig control. This is hardly ever needed on vhf but needs to seriously considered for HF where you have a lot more settings to remotely control. USB remote control has for the most part eliminated the need for the USB to Serial to CIV control scheme but be prepared to purchase another USB port and level conversion interface for that purpose when using the Signal Link on HF.

Interface Software:

OHDEN does not believe in always being up to date with the latest FLDIGI and accessory software versions. We (will soon) have a member who monitors versions of the NBEMS package and will post on this section the recommended version for official net use. This is especially true of FLMSG which is used for transfer into and from the FLDIGI transport layer. Once this configuration manager is named, members are encouraged to pass any experiences they have with various platforms to this station. **Control of configuration can be mission critical when it comes to sending messages and the versions of sender and receiver do not line up.   Check our Facebook page for the latest approved common software.**

Hints and Kinks:

Data Output Settings and Adjustments:

- Place your radio in CW mode and find that rusty old key or the manual transmit control.
- Always set your radio RF drive up to maximum CW RF output (usually 100 watts) when tuning into your dummy load and leave it there. Adjusting this control to lower levels to cut back your digital output power can introduce major distortion into your data signal. Modern SSB transceivers are designed to be the most linear at full CW setting of this control with processing upstream to limit the actual non cw output to proper values. There are some exceptions to this rule for newer Software Defined Radios which allow you to set RF level to any power level you want to operate and use active ALC when your audio is higher than necessary for that % setting. This does not eliminate the requirement to make sure that all gain stages in the transmit or receive chain are not operating in a saturated region (adjustments always should be in mid range of the control).

- Turn off all your Compression and Speech Processor features on your radio. This can be done by using the data mode or manually if required on some radios. This processing can actually make your data signal worse instead of better. Many newer radios do this for you.

- Turn off the CW mode. Use the tune button on FLDIGI to adjust your Power Output to ~ 40% of that maximum or the maximum power output recommended by your users manual for **AM mode**. This equates to maximum RF forward power meter reading of about **40 watts** for a typical 100 watt SSB transmitter. You may have up to four data output level controls on your system to adjust the first time. These are in order:

  - o The FLDIGI unique sound slider (Windows 7-10) visible from Task Bar
  - o Windows Master Volume Control for that Sound Channel.
  - o The Hardware TRANSMIT potentiometer on MODEMs such as Signal Link.
  - o The Rig Microphone gain control (only if you are coming in to radio via the mike connector)

- Tier these levels down from source to destination path. Start at 50% on each one and gradually tier these up or down to allow the lowest ranking control to have maximum effect on power output range. If you have, for instance, the transceiver mike gain on 100% , it picks up much more (noise + signal) as it passes through the other software and hardware gain controls. Like wise if you have it near zero, the other stages of signal processing may have to be pressed to output more than they are designed for again distorting your signal. The good news is that you only need to do this once and while on a dummy load.
- A much better solution than coming into HF radio mike connector is to use the data connector on rear panel of radio along with the kit from MODEM vendor. This provides access to a fixed gain audio input which allows you to keep your mike plugged in (and no need to adjust mike gain when going to digital.

Warning: If you are using normal SSB modes on radio, your mike connector mayl still be active but you can disable it by setting mike gain to zero when on digital . You can also select appropriate data mode on transceiver and it will automatically disable the mike. Signal Link provides modules to provide proper interface with each modem. Use them if possible.

- ALWAYS include one or two clamp on rf chokes on all interface lines between modem, computer and transceiver to keep RF from getting into the audio, control, and PTT lines.
- Once you have determined the proper settings on the dummy load, make a schedule with a local mentor that can help you make the final adjustments before going on the air.
- Attenuate these local contacts as much as possible to prevent receiver overload from giving you a false impression of bad transmit audio.
- Remember that Olivia is a high duty cycle mode and you must make sure you do not overheat your Power Amplifier in Radio. Use maximum duty cycle recommendations for AM in your manual and be prepared to back your output even further if you can and still maintain communications.
- Never try to set your waterfall data carrier below 650 Hz or above 1500 Hz . You can always adjust your VFO to reach signals not centered in the audio passband of your transceiver. FLDIG does not know what the transmitter passband is and parts of your data transmission may be chopped off. On OHDEN we always choose, data carrier offsets with mode depended bandwidths in mind.
- Some hams homebrew interfaces and this is a great learning experience to understand how the signals get in and out of FLDIGI. The most critical part is RF shielding and use of proper differential modes (via transformer coupling) near the devices. High SWR on feedlines compounds the need for shielded signal lines. Use what your vendor supplies and be ready for extra filtering.

Data Input Settings and Adjustments:

- Data input (from Receiver via modem to FLDIGI) is much easier to setup and these mis-adjustments will only effect your optimal reception and not the entire network.
- Start at signal source (speaker or headphone output, Rear Panel Fixed Volume Output) and jot down signal levels you see on scope or rms AC multimeter when listening to something like 14.070 MHz PSK31. This is almost always a good source of signals of various levels. Olivia signals except on nets are rare and adjusting your receive with PSK31 is a good first step. This step may be useful if your system quits working later.
- These signals should be transformer coupled like the transmitter inputs. This is usually taken care of in modern modems.
- Set up your station per the FLDIGI recommendations. Use default audio input sensitivity on FLDIGI and save settings.
- Bear in mind that different data modes require different IF bandwidth settings on receiver for optimum signal to noise.
- Adjust all Input controls to center of range if they are adjustable.
- Set up the IF bandwidth on radio to fade out the waterfall on frequencies outside the data passband for mode being used. Depending on your receiver, this may be a brick wall or very broad.

- I use a 1000 Hz IF filter setting on my ICOMs. I have it set so there are only occasional flashes of noise outside of the data passband. If you see constant grass outside the data band, this only adds to the noise the decoder has to process to see the actual data.
- For example, OHDEN uses a data carrier offset of 1500 Hz on Olivia 8-500. This means the data needs to be filtered for maximum pass between 1250 -1750 Hz above your upper sideband suppressed carrier. Anything you can do to make that region show water falling there alone helps the software decode the signal. If you are seeing traces below 1250 Hz or above 1750 Hz, back off on RX gain (software slider on FLDIGI window) or tighten the radio IF filter. Also remember that wider modes will require opening up the IF filter appropriately.
- Remember, strong signal conditions will likely not need this optimization, but to achieve maximum signal to noise , these slight tweaks may allow you to hear better and avoid double transmissions when weaker stations are transmitting.

Host Operating System :

- If you are using any form of the LINUX operating system. You are reading the wrong section and will know how to install and adjust drivers etc better than the authors.
- On the other hand, most of our users come to us with various versions of Windows OS. Most FLDIGI problems I have helped to troubleshoot over past 10 years were with the OS itself and the complexities of Windows once you get past plug and play.
- It is highly recommended that FLDIGI users get out of their comfort zone and really try to master some of the Windows internals of their computer before blaming FLDIGI for not working.
- These features(?)   are important to understand:
    - Where are your audio controls located and have you given an easy to identify name to the audio channels that shows up in Application Hardware (i.e. Signal Link to XMIT instead of codec xxxx)
    - How do you get access to sound setup.
    - Many newer OEM machines (DELL, HP) have an OEM sound level laid on top of Windows and you must understand how those two levels conflict at times.
    - Develop a basic understanding of how USB channels are used and shared on your computer. Once you start hanging on a lot of ham stuff, you can experience many incompatibilities as Windows constantly changes on how to manage the audio interface.
    - User driver updates from your OEM if at all possible. Putting in Generic Windows Drivers may destroy unique tailoring the OEM has performed.

Example Station Configuration

Auto Cad DWG To be supplied at a later date.

NVIS Propagation and Band and Mode Selection

As of February 25, 2019 , OHDEN is operating on Primary channel of 3584.500 MHz USB in Olivia 8-500 mode between 1500-1600 each Sunday for training. We use 1500 Hz tone offset resulting in a data signal centered on 3586.000 KHz. This higher tone offset helps prevent second harmonics passing through the transmitter voice filters on most radios. These harmonics get triggered when the signal is even slightly overdriven so always use this offset on all our modes and adjust your VFO as necessary. During the Standard Time Months, 80 meter short skip can become very long thus making in-state NVIS contacts next to impossible at times after dark. We may have to use our 160 meter frequency during evening or night time operations. During the 2018-2019 winter months , we are conducting an experimental net to study the propagation conditions on one of all alternate frequencies on 160 mwrwea. We will post any different frequencies for missions or training exercises on the FACEBOOK page. We also encourage any operators with 160 meter antennas to help check out point to point Olivia coverage on 160 meters on the OHDEN network.

The checkin mode is Olivia 8-500 subject to change by Net Control Station during bulletin or point to point traffic handling. We have experimented with a more rapid but

This section contains information on selecting the appropriate frequency (ies) for best intra Ohio data transfer based on Time of Day, Season, location of net, and ionospheric conditions. Table I shows the standard rule of thumb default values to choose (from a technical standpoint) the best band to use at given situation. These decisions must be tempered by the ASEC or Net Manager to include other practical drivers including resources that can operate on those frequencies in a given situation. Table I is intended only to be a starting point, OHDEN encourages member input on success and failures of other frequencies at the ranges we operate under.   The white paper http://www.FACEBOOK.com/groups/OHDEN data on f0F2 and on why a given NVIS frequency band is optimum at a give time and variables we must considered using frequency agile operations. We do not propose sophisticated Agile Link Enable (ALE) technology which the military uses, but with some care we can use a down to earth KISS system to avoid where the skip is either too long or D layer absorbsion is simply too high to provide useful results..

Figure I shows the vast variations in the ionosphere that cause our optimum frequency (f0F2) to shift with seasonal, sunspot numbers, and daily variations. We are not expected to understand all the physics behind this magic, but learning to operate within the cards the sun deals us is important in being a good communicator on HF bands. OHDEN intends on paying much more attention to f0F2 variations in the future.

Figure I

diurnal variation of foF2
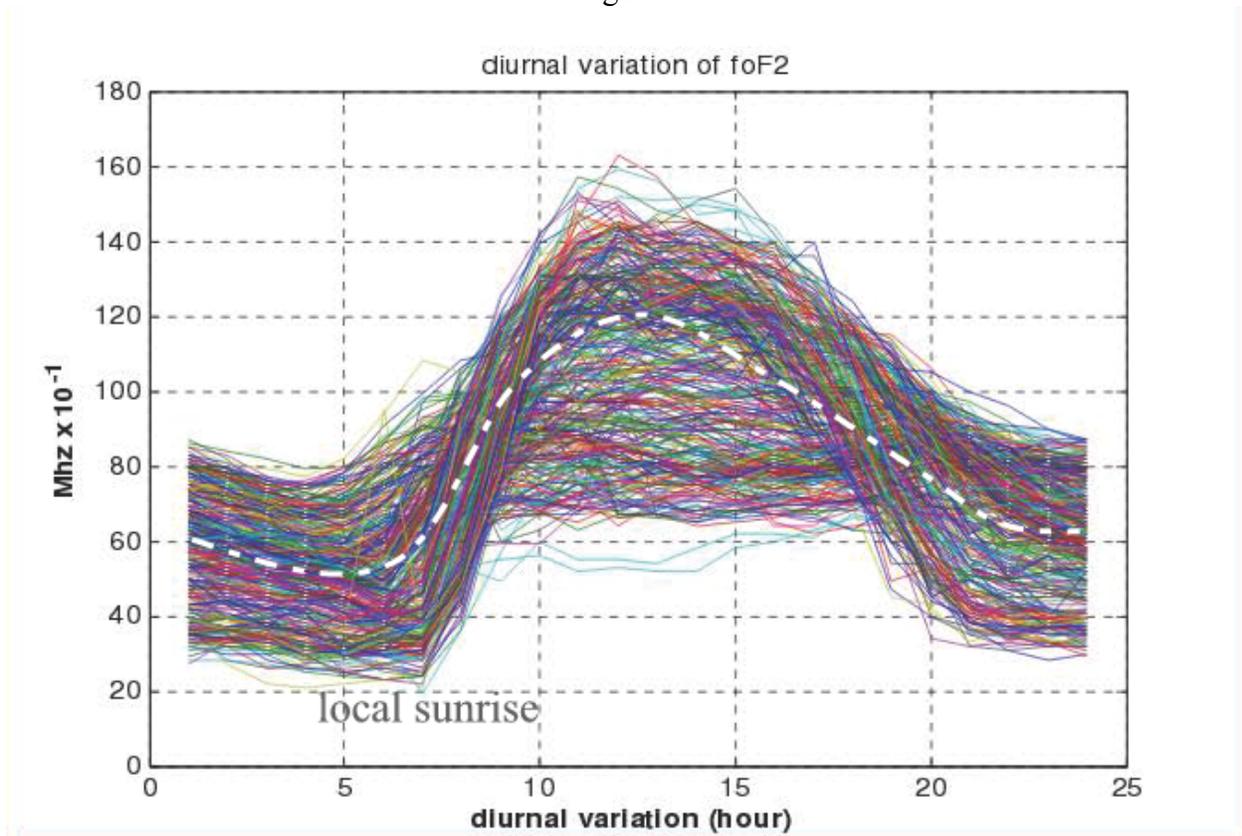
Each colored line represents a given long term sunspot number driving f0F2 variation as a baseline. The dotted line gives a median value of the entire eleven year set of data in last solar cycle and validates why we are seeing poor 40 meter nighttime and even 80 meter performance at times. At this point in time (2017) the median value of diurnal (daily) modulation is from about 2.5 MHz at sunrise to about 7 Mhz late in the afternoon.   It changes faster in morning hours than evening as sun is illuminating the F layer with UV radiation. It reaches a maximum around local noon time at all points in the eleven year cycle.. This chart is only a tool in understanding the variation and is not a substitute for using real time observations and predictions from the Internet available from sites such as

http://www.hamqsl.com/solar3.html#f0f2

Observing the charts at this site for a few days before an event will help forecast what conditions will be for day zero.

The snapshot in Figure II shows 80 meters would be very poor on the day and time shown. 160 meters would be great proving QRN was low. Guess why the CQ 160 meter contest is conducted on the date shown!

Figure II

Global Real Time Ionospheric foF2 Map   29 January 2017 Hour:07 UT
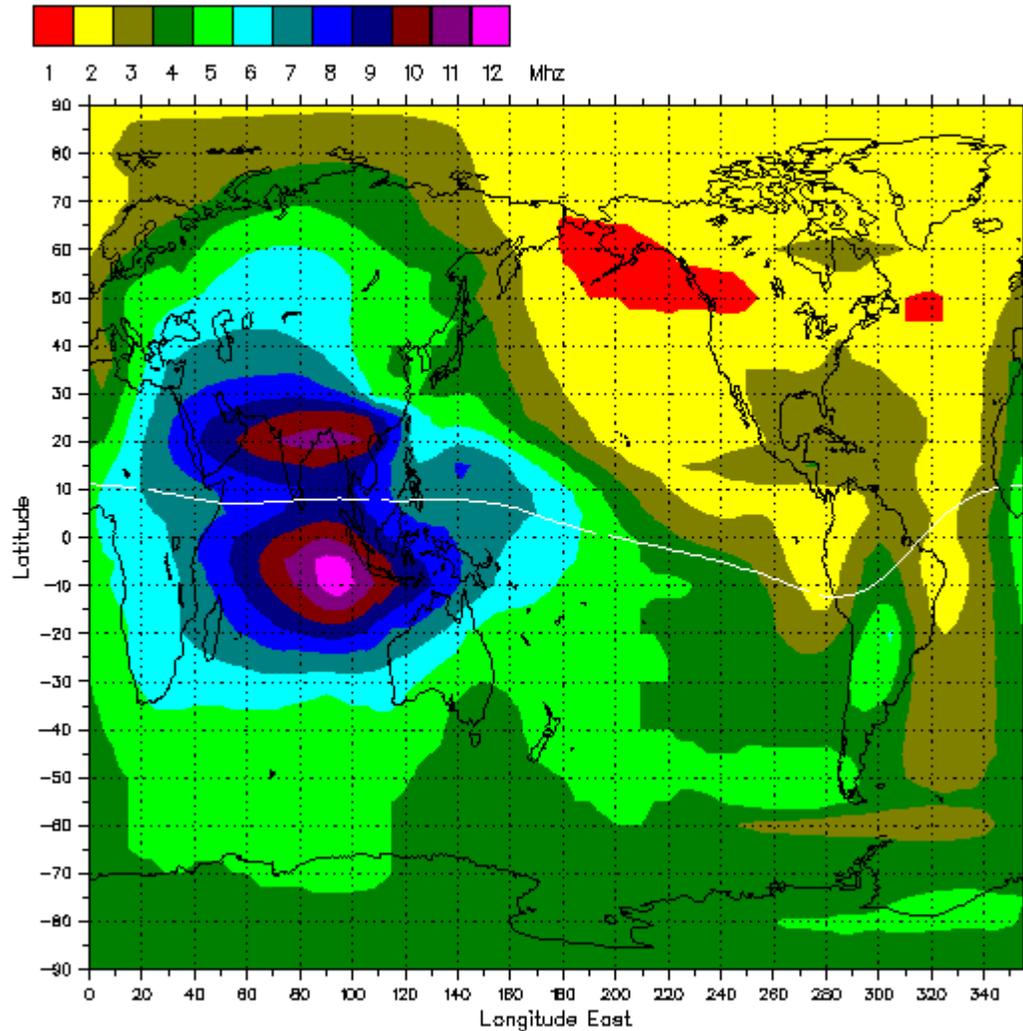
Copyright Commonwealth of Australia 2017, Bureau of Meteorology   Created at 29/01/2017 07:04:28UT

Table I

Freq Band	Frequency MHz Suppressed Carrier	Sunspot Cycle Phase.	Time of Day	Season	K index limits	Ap Index	Comment
160 Meters	1804.500 KHz USB Data Carriers at 1500Hz.	Low	Sunset to Sunrise local	Winter	0-3	H or L	Good choice when 80 meter skip too long. Very underutilized. Poor during thunderstorms but that is usually not an issue in Winter Months. This band is under investigation for increased usage by OHDEN. This band has the best Ground Wave propagation for the first 60 miles but requires antennas optimized for NVIS on Top Band. Volunteers to assist in research on this band are asked to contact W5UHQ@arrl.net to set up schedules.
80 Meters	3584.500 USB Data Carriers at 1500Hz. We have moved our data center up by 500 Hz and vfo down by 500 Hz to prevent MT-63-1000 transmissions from going outside of transmitter bandwidth. This also allows RX to	Low to Mid	2 hour before until 10 AM local.	Summeris Best	1-3	Lower the better on this band.	Default for OHDEN because of night time scheduling. Static may make band unable when near thunderstorms. Long skip may prevent in state NVIS due to higher F layer altitude. Worst right at sundown where grey line phenomena extend DX and allow high angle signals to go to Mars

Freq Band	Frequency MHz Suppressed Carrier	Sunspot Cycle Phase.	Time of Day	Season	K index limits	Ap Index	Comment
	==make better use of their narrow IF filters that do not like data frequencies approaching zero Hz.==						
60 Meters Common 60 meter	Channel 1: 5330.500 kHz Channel 2: 5346.500 kHz Channel 3: 5357.5 kHz Channel 4: 5373.0 kHz . Channel 5: 5403.5 kHz VFO suppressed carrier frequencies. Set Data offset at 1500Hz. This will allow +/- 250 Hz (Olivia 8-500) and +/- 500 Hz modes (MT-63-1KL) to lie within the maximum	Low to High .	24 hr although best during daylight hours for in state.	Winter is best.	1-3		During low sunspot activity, this band has the best and worst characteristics of 80 and 40 but is sometimes overcrowded due to limited channels. It is most useful between 10 AM and 4 PM when 80 goes dead due to absorbsion in D layer and when skip may be too long on 40 meters. All OHDEN members are encouraged to develop capability and practice on this band. OHDEN tries to routinely avoid using this overcrowded band despite it's technical advantages. We usually will leave it for Regional and Agency activities > 500 miles and try to avoid putting county to county traffic on when it is not absolutely necessary. This band is also a secondary amateur allocation and care must be taken to avoid interference to Military and Government Agency

Freq Band	Frequency MHz Suppressed Carrier	Sunspot Cycle Phase.	Time of Day	Season	K index limits	Ap Index	Comment
	2.8KHz bandwidth. .						users unless specific authority is granted in a special use permit for the exercise. Be very careful to keep your continuous data transmissions less than 10 minute ID periods when you should listen for any other primary users who may require the frequency. See http://www.arrl.org/60m-channel-allocation for additional information.
40 Meters	7044.500 KHz USB with 1500 Hz data offset.	All	Daytime Only	Summer is Best	1-2	1-15	Best default daytime band during normal and low sunspot activity, It is most useful between 10 AM and 4 PM when 80 goes dead and magnetic disturbances are not causing long skip.
30, 20, 17, 15,12, and 10, Meters	All	Low	NA	NA	NA	NA	These HF bands are out of range for any effective NVIS mode communication. They may be used for point to point troposphere, ground wave, or back scatter at times but should not be relied on outside the county even when skip is not present like during low point in Sunspot Cycle.
6 Meters	50.500 USB Or 5KHz Deviation FM.	All	All	All	1-3	All	This is a magic band that can be pressed into service to fill those point to point 1-100 mile hops

Freq Band	Frequency MHz Suppressed Carrier	Sunspot Cycle Phase.	Time of Day	Season	K index limits	Ap Index	Comment
	All FLDIGI modes up to 1KHz bandwidth. This is a special ARRL band plan frequency that allows both voice, cw, and data.						that NVIS and VHF/UHF links miss. A good OHDEN station should have a beam pointed W8SGT to provide this secondary path. Six Meters in general is not practical for a state wide net except for direct communications with the State EOC due to the directional antennas required.

Alternative Modes Pros and Cons

Tests were made in 2017 that determined Olivia 8-500 provided the best overall success data transfer. It has thus been adopted as the default QNI (check in) mode.

Metrics Included:
- Data Transfer Speed in ASCII bytes per second
- Protocol sync up time.
- Channel Bandwidth
- Error Detection at bit levels
- Error Detection and Correction at protocol levels.
- Ease of set up.
- Compatibility with the NBEMS suite of message transfer co programs.

The main deficiency in Olivia Mode is lack of a rapid turnaround between transmissions. The lock in delay at beginning of a block can be up to five seconds making rapid checkins impractical.

MT-63-2000L used widely on VHF is usually to error prone on our HF channels. It can be effective on short hops. Tests on six meters indicate that even on that band, the wider bandwidth causes bit dropouts at about the S2 level.

MT-63-1000L which is half as fast but two times narrower bandwidth provides a robust compromise between 2000L and Olivia 8-500 . NCS stations are encouraged to suggest it's use for passing traffic if conditions warrant.

K1JT is working on enhancements to the popular FT-8 package more suitable for field day , contests, and other non DX contacts. These enhancements are being watched closely for QNI use on a fast check in net like OHDEN. The combination of using Olivia with this MFSK mode will be watched closely in 2019 for use in OHDEN. Envision a waterfall separated by ten district channels where up to 10 checkins are processed in a minute time using frequency and time diversity and closely synchronized station clocks..

Challenges include having two distinct software packages running at same time, frequency challenges, and development of check in to message passing paradigms. Any OHDEN member wishing to experiment with this concept are asked to contact the Net Manager.

OHDEN Abbreviations and Pro Words

At member and served agency request, OHDEN does not use a lot of abbreviations , Q-Signals, and other ham lingo that are frequently used in CW traffic nets. We try to use plain text wherever possible but resort by habit on phrases that are a pain to type. When in doubt, spell it out!

Here is a growing list of abbreviations that are OK to use in transmissions. OK but not required.

QNI - checkin
QRU - no traffic
QNC – Bulletin Traffic for the net or all listening stations.
QST – Calling all radio amateurs. Typically sent at beginning of a Bulletin to get everyone's attention for an upcoming one way message.
QTC - I have message
QTC? - Do you have traffic
OHDEN - Ohio Digital Emergency Net
NCS - Net Control
ANCS Alternate Net Control
SARGE or W8SGT - State EOC Station W8SGT
EC - Emergency Coordinator County Level in Ohio.
DECx - District Emergency Coordinator   (x = 1..10 in Ohio) See map on cover sheet.
SEC - Section Emergency Coordinator N8BHL
ASEC - Assistant SEC various functions N8BBL
OHDEN NM - Net Manager W5UHQ reports to SEC
SCM - Section Communications Manager   N8SY
BT - Break on Voice or _..._ on CW.   We use this symbol between paragraphs.
BK Break IN/OUT - _..._._   on CW. We use this during contacts to signify OVER and sending station is going into RX mode. It is not always possible to determine the over like on VHF or voice.
SK - End of series of transmissions   Sending station is clear.
NNNN- Military designation at the end of a digital message set to signify nothing follows.
RYRY - A carry over baudot tradition to send at beginning of a RTTY transmission to allow proper tuning. This pattern contains alternate mark and space tones only on RTTY and is of no technical merit on any of the newer digital modes. . Some stations for nostalgia reasons send it on preamble as an attention getter.

Reporting Activity

OHDEN activity is now reported via ARRL connect. At this time we track points for all OHDEN preparation and operation. Stations may use self reporting after 1 October, 2018, So make sure you are signed up on ARRS connect for each week that you have activity. Keep your local EC informed of your OHDEN activity especially until the Connect Data Base becomes routine.

Net Control Stations

OHDEN operates under the philosophy that any of our stations should be prepared to take NCS when the scheduled station is not available or a local situation deems activation of the Section Wide net. When the training session is not activated by the scheduled NCS, one of the regular net members is encouraged to open the net NLT than ten minutes past start time. The following schedule is currently in effect:

All training sessions begin at 1500 (Sundays) and 1945 local time Tuesdays (standard or DST as it applies)

Week 1 Sunday and Tuesday Nets Vacant.
Anyone interested jump in and assume net ten minutes after scheduled start until this slot is filled on a permanent basis.   It is good practice and Net Manager and ASEC/D will not necessarily jump into be Net Control. Hopefully this will encourage more members to add this training to their credential list.

WB8PMG David Robinson Second Sunday and Tuesday of Each Month.

N8BBL Gary Harbaugh Week Third Sunday and Tuesday of Each Month.

W5UHQ Eldon Peterson Fourth Tuesday of Each Month

W5UHQ Eldon Peterson Fifth Tuesday when applicable.

Net Control Stations are requested to contact an alternate of the Net Manager at least six hours before net if they must be absent. This is only fair to the other stations who must maintain their schedules.

All net control stations are asked to provide the check in check in roster to Net Manager within one week of conducting a net session. An ICS-309 from FLMSG (or equivalent text file) is appreciated but not required. Examples are contained on the FACEBOOK site. Hopefully the standard check in syntax will streamline filling in the fields on the ICS-309 or equivalent.

The net manager will compile statistics from the check in logs and ARES connect data base. He will send a statistics message to SEC each month.

Training for Net Control Stations is only OJT at this time. Those interested should read the Net Procedures and observe NCS activities and then jump in the fire. Nothing is gained by not stepping up the challenge of directing a net. There is a section in this SOG for suggestions for the NCS procedures.

Standard Check In Syntax

OHDEN encourages the use of this syntax for checking into the net. We call the net by groups of ARES districts. When your district is called, make sure your transmit data is centered on the NCS waterfall pattern. For consistency, place the string below in one of your programmed macro keys of FLDIGI. The use of the standard syntax (including the comma delimiters) allows the NCS to quickly paste your check in to their logging data base. The comma serves as a delimiter (i.e. CSV format) for separating the key data fields of the check in data base.   The syntax below was developed after a year of trying to balance quick check ins with enough info to make it meaningful; in all situations. Listen for a clear channel and then execute your check in macro.

We are not so formal as to **require** this syntax, but it does allow the NCS to keep net moving faster and keep all information pertinent to the check in without reformatting it on the fly. The standard minimum check in syntax is:

<TX>
<enter><enter>
OHDEN de , <Your_Call> , OP Name, District Name, County Abrev, QTC or QRU , [optional items separated by tabs] , <Your_Call> , bt <RX>

Here is an example:
<TX>
<enter><enter>
OHDEN de ,WD8JLP,Mike,D7,LIC,One Test Priority for W8SGT, [Licking Gateway, AEC] , WD8JLP, bt
<enter><enter>
<RX>

NOTE: The syntax has changed since originally published. Please check your macros, many stations still do not comply and this causes extra delay for NCS, slows down the net, and the <enter><enter> at beginning of each transmission serves as a separator on receiving end and makes the message always start on a new line. It is especially important for Olivia and MT-63 to give the decoder something to chew on (i.e. sync up on) before serious data is sent. Failure to enter these end of line delimiters can cause the first few characters of your data to be truncated to receiver.

Optional items are any combination of [local ARES Affiliation tags separated with commas] information such as a special assignment, at Red Cross or location, or liaison assignments] contained within braces,

When listing QTC (traffic), list it like "Two Priority for W8SGT" , "One Training message for net", etc. If you have no traffic, simply put down "QRU" or "no traffic".

We use the ODOT Three Letter county abbreviation codes. An out of state visitor would substitute State abbreviation for District number with the District set to Oos . County abbreviations are listed in Table II of this SOG.

D# is a D followed by numeral; 1-10 of your ARES District in Ohio. i.e D10 not District Number Ten

D# is OOS for out of state stations who are always welcomed as visitors.

This is easily programmed into a checkin macro key in FLDIGI to make it consistent and easy. See the FLDIGI manual on programming macros.

County Abbreviation Table II

Courtesy ODOT
-- used for OHDEN data base and Checkin tag--

COUNTY NAME	ABBR	COUNTY NAME	ABBR
Adams	ADA	Holmes	HOL
Allen	ALL	Huron	HUR
Ashland	ASD	Jackson	JAC
Ashtabula	ATB	Jefferson	JEF
Athens	ATH	Knox	KNO
Auglaize	AUG	Lake	LAK
Belmont	BEL	Lawrence	LAW
Brown	BRO	Licking	LIC
Butler	BUT	Logan	LOG
Carroll	CAR	Lorain	LOR
Champaign	CHP	Miami	MIA
Clark	CLA	Monroe	MOE
Clermont	CLE	Montgomery	MOT
Clinton	CLI	Morgan	MRG
Columbiana	COL	Morrow	MRW
Coshocton	COS	Muskingum	MUS
Crawford	CRA	Noble	NOB
Cuyahoga	CUY	Ottawa	OTT
Darke	DAR	Paulding	PAU
Defiance	DEF	Perry	PER
Delaware	DEL	Pickaway	PIC
Erie	ERI	Pike	PIK
Fairfield	FAI	Portage	POR
Fayette	FAY	Preble	PRE
Franklin	FRA	Putnam	PUT
Fulton	FUL	Richland	RIC
Gallia	GAL	Ross	ROS
Geauga	GEA	Sandusky	SAN
Greene	GRE	Scioto	SCI
Guernsey	GUE	Seneca	SEN
Hamilton	HAM	Shelby	SHE
Hancock	HAN	Stark	STA
Hardin	HAR	Summit	SUM
Harrison	HAS	Trumbull	TRU
Lucas	LUC	Tuscarawas	TUS
Madison	MAD	Union	UNI
Mahoning	MAH	Van Wert	VAN
Marion	MAR	Vinton	VIN
Medina	MED	Warren	WAR
Meigs	MEG	Washington	WAS
Mercer	MER	Wayne	WAY
Henry	HEN	Williams	WIL
Highland	HIG	Wood	WOO
Hocking	HOC	Wyandot	WYA
		Out of State	ABBR

Check Ins and Passing Traffic On OHDEN

- Traffic passing on OHDEN depends on the nature of the net. For Training purposes we always ask for NO PLAY or EXERCISE emergency, priority, or time sensitive traffic at beginning of roll call. Any routine traffic (including Welfare) traffic is delayed until end of roll call and is sent at request of NCS since this is a directed net. In other situations it is up to the NCS to determine precedence handling based on tactical situations. Traffic needing immediate feedback should be so indicated on form and designated "Time Sensitive".

- Traffic Precedence preceded by EXERCISE like EXERCISE PRIORITY is handled as if it were an actual Priority situation and is handled immediately after being listed unless it is lower in precedence than what is currently in progress. This is to allow stations to get used to the various Precedence order and how we must switch gears as the QTC queue changes. This is a great carry over from the Radiogramm guys and unfortunately missing from the ICS-213 forms we use in Ohio.

- Actual mission traffic or weekly training messages will never include the PROWORD EXERCISE Routine one-to-one or one to many traffic will be handled after check in or tabled until a destination station checks in. In the event that actual emergency messages come through during an exercise the pro word NO PLAY should sent on headers and by the NCS when the net goes into actual mission mode.

- For training purposes the receiving station may send back the reply on ICS-213 (unless directed otherwise by a training objective) with a fabricated answer with EXERCISE on it. This is because simulated messages to a station like W8SGT may not have the addressee available unless it is a real mission. In those cases a quick response is what from the receiving operator.

- The NCS is responsible for lining up traffic in precedence order after stations check in and changing the priority of traffic in queue once listed based on dynamic situations.

- The NCS directs the sending station to establish contact with the receiving station for one to one traffic. Stations should always insure two way contact before any message transfer is attempted.

- The NCS (after examining all traffic listed) calls the sending station to call xxxxxx for yyyyy traffic.

- The receiving station sends back a QRV Olivia message if he copies sender at message quality in the current mode. Experienced operators may send the short replies in CW to save time.

- The receiving station is in best position to request a higher speed mode. If a higher speed mode is indicated, in this case he/she sends a QRV <mode> ? to the sending station. the sending station will make the next transmission in the higher speed mode (i.e. MT-63-1000L etc) before commencing the message.

- If they both can copy each other in the higher speed mode, the receiving station sends a final QRV <mode> and stands by for the traffic itself. The traffic is usually sent from FLMSG software to FLDIGI.

- At the end of message, the receiving station sends back a QSL message number on a Radio Gram, or the date time of ICS form being sent. This is very important and allows everyone to make sure which message is being acknowledged.

- Never Roger a message if you have not received it correctly. We never guess what missing characters are in a real net or SET exercise. Training messages with holes are a slightly different situation and partial receptions are OK providing you tell the sender you received a partial print. We do not want to tie up training nets helping stations to fine tune their equipment trying to get perfect copy. This should not be looked at as a low quality process but an indicator that further technical work may be needed to resolve technical or propagation issues on the net.

- The sending station then goes back to the net default mode and signifies that all traffic is completed or number of messages if difficulties are encountered,

- This sequence of channel checks, message sending, message confirmation continues until the number of messages indicated by NCS is sent. If sender has multiple messages they will be broken up by NCS into smaller chunks.

- **State EOC Routine Bulletins** (one to many) are handled differently to speed things up. The sender calls the NCS and lists their Bulletin(s) and destinations, then the NCS calls the station with the bulletin and asks him/her to send the bulletin to entire net (or a subgroup of Districts)in the mode NCS thinks is most appropriate to band conditions. The bulletin is then sent to those stations net by sender in the blind. At the end, the NCS only asks stations needing fills or repeats and does not require an explicit Roger from each station. A positive acknowledgement is implied with no response. The NCS will handle that at end of traffic session by noting in their log which QNI did not send a negative acknowledgement for the list of QTC. Please make sure bulletins are listed with proper precedence. An EXERCISE PRIORITY bulletin may take a lot of time (with re-transmissions but it is important for stations and NCS to build this rather cumbersome process into their skill set.

- State EOC Priority Bulletins are handled as above but will require a checksum and individual positive acknowledgment UNLESS SPECIFICALLY OVER RIDEN BY THE EXERCISE COORDINATOR OR SEC.

Experimental Nets

Stations with ideas they want to try or participate in Beta Testing modes, procedures, or alternate bands are encouraged to contact the Net Manager or ASEC/D and list their available times and days when they could participate. Currently we are experimenting on 160 meters during night-time hours of the short day winter season.

OHDEN Coverage and Activity Maps

This series of maps shows QNI statistics for the net over the fiscal quarter indicated. The purpose is to give our ARES Leadership Team and Agencies a graphical view of OHDEN readiness to be backup for their needs. A " ☺ " in a county indicates two or more stations have checked in with a cumulative value of 5 check ins in that quarter. A " ☆ " indicates at least one check in from that county. This chart only covers Oct – December of 2016. Subsequent quarterly updates along with tabulated roster will be sent to ARES leadership team and posted on the FACEBOOK site each quarter thereafter. Counties with no symbol indicate no recorded check ins that quarter.

OHDEN Checkins by County October – December 2016

" ☺ " in a county indicates two or more stations have checked in with a cumulative value of 5 check ins in that quarter.

A " ✿ " indicates at least one check in from that county.

Clicking symbols ☺ should launch qrz.com data for that station.
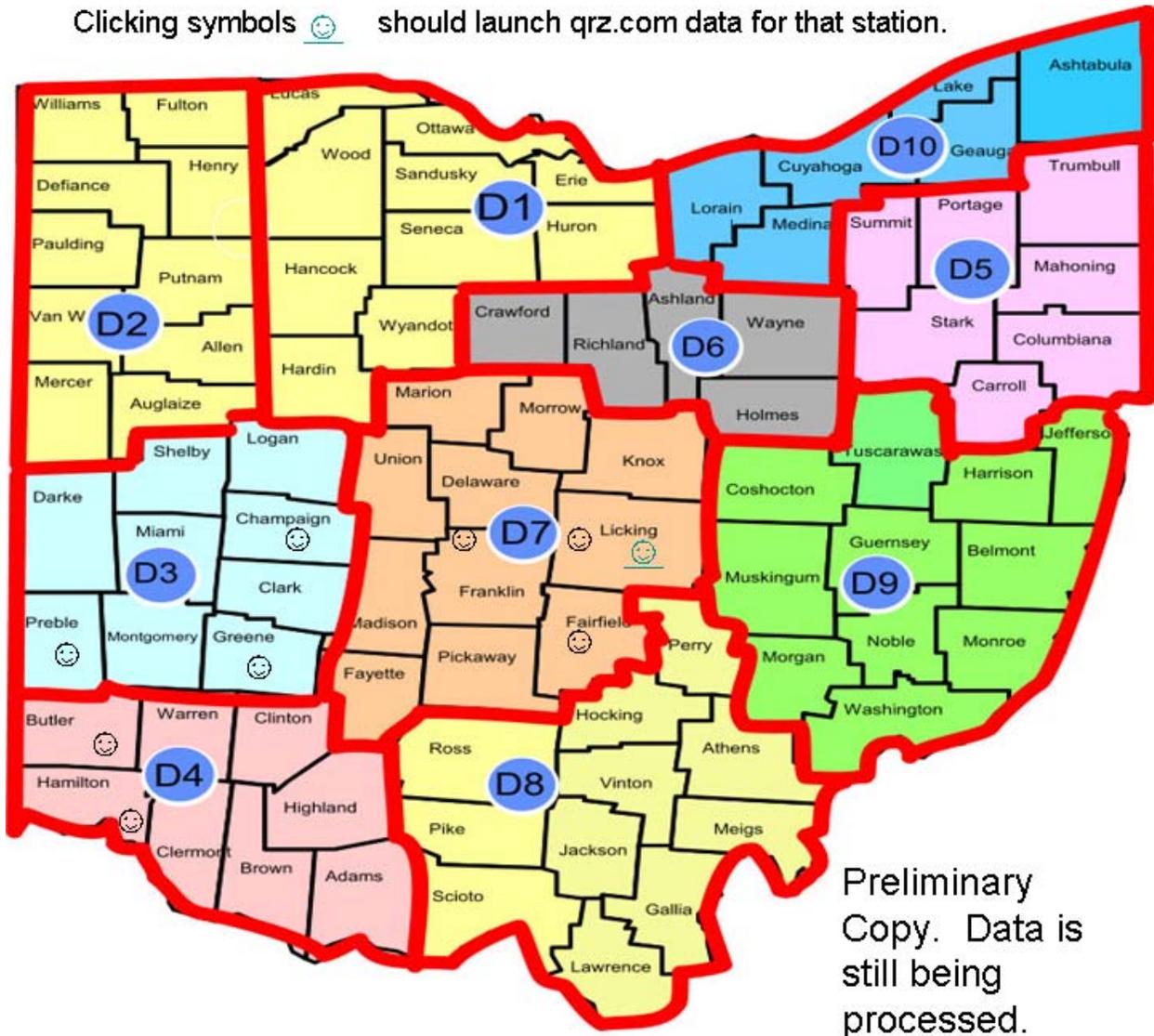
Preliminary Copy. Data is still being processed.

OES Designations

Starting on Jan 1, 2019 This recognition metric will be developed into a award of a special OHDEN Emergency Station Certificates (OES) status to Ohio stations recording twelve or more check ins during a calendar year, having exchanged at least one EXERCISE or actual message with W8SGT that year, served as a NCS or alternate NCS at least one session, together with endorsement from their local EC indicating good standing with their local ARES operations. Nominees must also meet the criteria of ARRL in the link above.

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Net Control Instructions and FLDIGI Macros:

The following macros are optional for NCS and alternates. They are only suggestions and provide a standard that stations are used to each session. The roger and roster macros must be opened for edit (right click) to insert the real time check in info saved after each station checks in. It is suggested that we break out the districts as shown due to the volume of check ins from each location. We normally only include the callsign and district on the roger messages and the full checkin string on the roster file.

Make sure you have all your default settings checked out before assuming Net Control. Practice with a local buddy to be sure.

Make sure your radio is set to correct carrier frequency and sideband mode. Yaesu rigs include default data tone offsets in the VFO read outs when in digital modes so be careful that you are on correct frequency and sideband. Checking with a known accurate receiver or friend can help you establish that you are indeed on the correct frequency when starting a net.

Use the test button on top of FLDIGI screen to send a test tone on the center of data point to check your output wattage before you start up the net.

Adjust your observed output data to 70% or lower as observed on rf wattmeter compared to a full carrier mode like CW. See setup section in this guide.

Listen for a clear frequency. I try to set my IF filtering bandwidth centered at offset waterfall frequency (1500 Hz) using a combination of the RX level on computer soundcard, fldigi RX sitivity, and RX adjust on something like a Signal Link box. The objective is to show a slight band of yellow noise within the 500 or 1000 Hz windows for Olivia and MT-63-1000 when a station is transmitting. The waterfall outside the data bandwidth should show up a black background. Failure to make these tweaks will result in you missing weaker signals.

The following macros can be clipped out of this document and pasted into one of the unused macro banks on FLDIGI. I used bank 4 but they macros can really be pasted into any blank slot. Remember to place the title in title block and save the new macro file so you can use it again.

=====ADD THIS MACRO TO LINE 4=====TITLE OPEN NET=====

<TX>

QST QST QST QST
de <MYCALL> <MYCALL> CALLING the
OHIO DIGITAL EMERGENCY NET (OHDEN)
FOR <ZD>
MY NAME is: <MYNAME>
QTH is : <MYQTH>

NET INFO IS ON WWW.THEOHDEN.ORG
AND WWW.FACEBOOK.COM/GROUPS/OHDEN
TIME IS: <ZT> UTC
IS THERE ANY EMERGENCY OR PRIORITY TRAFFIC?

CALL NOW OR STAND BY FOR ROLL CALL.

BT <RX>

=====ADD THIS MACRO TO LINE 4===TITLE D1 D2 D3 CALL ======

<TX>

DE <MYCALL>/ NCS OHDEN
QRV FOR CHECK INS
PLEASE USE STD SYNTAX:

return return
OHDEN de, CALL, NAME,Dn ,CTY,TRAFFIC, [optional ID data], CALL, BT
return return

OH W8SGT and DISTRICTS 1, 2, 3 CALL NOW   BT

<RX>

=====ADD THIS MACRO TO LINE 4===D4 D5 D6 CALL ======

<TX>

DE <MYCALL>/ NCS OHDEN
QRV FOR CHECK INS:

PLEASE USE STD SYNTAX:

OH DISTRICTS 4,5,6 CALL NOW   BT

<RX>

=====ADD THIS MACRO TO LINE 4==== TITLE D7 D8 D9 D10 CALL=====

<TX>

DE <MYCALL>/ NCS OHDEN
QRV FOR CHECK INS:

PLEASE USE STD SYNTAX:

OH DISTRICTS 7,8,9,10 CALL NOW   BT

<RX>

=====ADD THIS MACRO TO LINE 4==== TITLE ROGER 1 2 3 ======

<TX>

OHDEN DE <MYCALL> NCS
AT <ZT> I ROGER:

ANY OTHERS D1..D3
CALL NOW BT

<RX>

=====ADD THIS MACRO TO LINE 4==== TITLE ROGER 4 5 6 ======

<TX>

OHDEN DE <MYCALL> NCS
AT <ZT> I ROGER:

ANY OTHERS D4..D6
CALL NOW BT

<RX>

=====ADD THIS MACRO TO LINE 4==== TITLE ROGER ANYONE ELSE=====

<TX>

OHDEN DE <MYCALL> NCS
AT <ZT> I ROGER:

ANY OTHERS ALL DISTRICTS AND OUT OF STATECALL NOW BT <RX>

CALL NOW BT

<RX>

=====ADD THIS MACRO TO LINE 4==== TITLE LIST ROSTER =====

<TX>

OHDEN DE <MYCALL> NCS
THE NET IS QRU

HERE IS THE FINAL QNI ROSTER:

ANY CORRECTIONS OR ADDITIONS

DE <MYCALL> LISTENING BT

<RX>

=====ADD THIS MACRO TO LINE 4==== TITLE CLOSE NET ======

<TX>

OHDEN DE <MYCALL> / NCS

THE NET IS QRU AT THIS TIME

THIS SESSION OF THE OHIO DIGITAL EMERGENCY NET IS
CLOSED AT <ZDT.

THANKS TO ALL QNI AND THOSE GIVING US
A CLEAR CHANNEL.

ANYONE IS WELCOME TO THIS TRAINING NET.

SEE YOU NEXT SESSION

DE <MYCALL> 73 SK CL

<RX>

Make sure you put in the hard returns (blank lines shown above) since this forces line feeds which help separate your transmission and improves sync up times in the digital modes we use.